

Claims

What is claimed is:

1 1. A semiconductor fabrication system, comprising:

2 a first semiconductor fabrication tool,

3 wherein the first semiconductor fabrication tool comprises a first chamber

4 configured to perform at least one process on a semiconductor wafer; and

5 a software application, in communication with the first semiconductor fabrication tool,

6 configured to determine first specified qualities of the first chamber in performing the at least

7 one process,

8 wherein the first specified qualities are directed to at least one of: a processing

9 time required to perform the at least one process, a rate of producing defective output products of

10 the at least one process, a uniformity of output products of the at least one process, and a

11 capability index of the at least one process.

1 2. The system of claim 1, wherein the at least one process of the first chamber is at least one

2 of a deposition process, an etching process, and a metrology process.

1 3. The system of claim 1, wherein the capability index is a Cpk value.

1 4. The system of claim 1, wherein the software application is further configured to generate

2 detailed status information that includes information relating to the first specified qualities of the

3 first chamber and relating to maintenance information of the first chamber.

1       5.     The system of claim 4, wherein the software application is further configured to receive a  
2     request from an external application to access the detailed status information and configured to  
3     make available only a pre-defined portion of the detailed status information to be accessed by the  
4     external application.

1       6.     The system of claim 1, wherein the first semiconductor fabrication tool further  
2     comprises:

3              a second chamber configured to perform at least one process on a semiconductor wafer,

4              wherein the software application is further configured to determine second specified  
5     qualities of the second chamber in performing the at least one process, and

6              wherein the second specified qualities are directed to at least one of: a processing time  
7     required to perform the at least one process of the second chamber, a rate of producing defective  
8     output products of the at least one process of the second chamber, a uniformity of output  
9     products of the at least one process of the second chamber, and a capability index of the at least  
10    one process of the second chamber.

1       7.     The system of claim 6, wherein the at least one process of the second chamber is at least  
2     one of a deposition process, an etching process, and a metrology process.

1       8.     The system of claim 6, wherein the software application is further configured to  
2              (a)     receive a request from an external application to qualify the first and second  
3     chambers for a first requested process; and

4                   (b)     make accessible information relating to the first and second specified qualities of  
5     the first and second chambers.

1     9.     The system of claim 6, wherein the software application is further configured to receive a  
2     request to perform a first requested process and select one or more of the first and second  
3     chambers to perform the first requested process based on specified preferences which form part  
4     of the request and on the information relating to the first and second specified qualities of the  
5     first and second chambers.

1     10.    The system of claim 8, wherein the external application is a remotely located external  
2     application in communication with the software application over the Internet.

1     11.    The system of claim 8, the external application communicates the request over a multi-  
2     channel communication link.

1     12.    A method of fabricating semiconductors, comprising the steps of :  
2               (1)     receiving data from a semiconductor fabrication tool, wherein the data is directed  
3     to the implementation of at least one process occurring within the semiconductor fabrication  
4     tool; and

5               (2)     determining, from the data of said step (1), first specified qualities of a first  
6     chamber of the semiconductor fabrication tool in performing the at least one process, wherein the  
7     first specified qualities are directed to at least one of: a processing time required to perform the at  
8     least one process, a rate of producing defective output products of the at least one process, a  
9     uniformity of output products of the at least one process, and a capability index of the at least  
10    one process of the first chamber.

1       13.     The method of claim 12, wherein the capability index is a Cpk value.

1       14.     The method of claim 12, wherein the at least one process of said step (1) is at least one of  
2     a deposition process, an etching process, and a metrology process as one of the at least one  
3     process of the first chamber.

1       15.     The method of claim 12, further comprising the step of:

2              generating detailed status information that includes information relating to the first  
3     specified qualities of the first chamber and relating to maintenance information of the first  
4     chamber.

1       16.     The method of claim 15, further comprising the step of:

2              (a)     receiving a request from an external application to access the detailed status  
3     information; and

4              (b)     making available only a pre-defined portion of the detailed status information to  
5     be accessed by the external application.

1       17.     The method of claim 12, further comprising the step of:

2              determining second specified qualities of a second chamber of the semiconductor  
3     fabrication tool in performing the at least one process, wherein the second specified qualities are  
4     directed to at least one of: a processing time required to perform the at least one process, a rate of  
5     producing defective output products of the at least one process, a uniformity of output products  
6     of the at least one process, and a capability index of the at least one process of the second  
7     chamber.

1       18. The method of claim 17, wherein the at least one process performed on the second  
2       chamber is at least one of a deposition process, an etching process, and a metrology process as  
3       one of the at least one process of the second chamber.

1       19. The method of claim 17, further comprising the step of:

2           (a) receiving a request from an external application to qualify the first and second  
3       chambers for a first requested process; and

4           (b) making accessible information relating to the first and second specified qualities  
5       of the first and second chambers.

1       20. The method of claim 17, further comprising the step of:

2           receiving a request to perform a first requested process and selecting one or more of the  
3       first and second chambers to perform the first requested process based on specified preferences  
4       which form part of the request and on the information relating to the first and second specified  
5       qualities of the first and second chambers.

1       21. The method of claim 19, further comprising the step of:

2           receiving commands from the external application over the Internet.

1       22. The method of claim 19, further comprising the step of:

2           receiving the request from the external application over a multi-channel communication  
3       link.

1       23. A system for fabrication semiconductors, comprising:

2           means for receiving data from a semiconductor fabrication tool, wherein the data is  
3       directed to the implementation of at least one process occurring within the semiconductor  
4       fabrication tool; and

5           means for determining first specified qualities of a first chamber of the semiconductor  
6       fabrication tool in performing the at least one process, wherein the first specified qualities are  
7       directed to at least one of: a processing time required to perform the at least one process, a rate of  
8       producing defective output products of the at least one process, a uniformity of output products  
9       of the at least one process, and a capability index of the at least one process of the first chamber.

1       24.      The system of claim 23, wherein the first chamber comprises:

2           means for performing at least one of a deposition process, an etching process, and a  
3       metrology process as one of the at least one process of the first chamber.

1       25.      The system of claim 23, wherein the capability index is a Cpk value.

1       26.      The system of claim 23, further comprising:

2           means for generating detailed status information that includes information relating to the  
3       first specified qualities of the first chamber and relating to maintenance information of the first  
4       chamber.

1       27.      The system of claim 26, further comprising:

2           means for receiving a request from an external application to access the detailed status  
3       information and configured to make available only a pre-defined portion of the detailed status  
4       information to be accessed by the external application.

1        28. The system of claim 23, further comprising:

2            means for determining second specified qualities of a second chamber of the  
3        semiconductor fabrication tool in performing the at least one process, wherein the second  
4        specified qualities are directed to at least one of: a processing time required to perform the at  
5        least one process, a rate of producing defective output products of the at least one process, a  
6        uniformity of output products of the at least one process, and a capability index of the at least  
7        one process of the second chamber.

1        29. The system of claim 28, wherein the second chamber comprises:

2            means for performing at least one of a deposition process, an etching process, and a  
3        metrology process as one of the at least one process of the second chamber.

1        30. The system of claim 28, further comprising:

2            (a)      means for receiving a request from an external application to qualify the first and  
3        second chambers for a first requested process; and

4            (b)      means for making accessible information relating to the first and second specified  
5        qualities of the first and second chambers.

1        31. The system of claim 28, further comprising:

2            means for receiving a request to perform a first requested process and selecting one or  
3        more of the first and second chambers to perform the first requested process based on specified  
4        preferences which form part of the request the first requested process and on the information  
5        relating to the first and second specified qualities of the first and second chambers.

1 32. The system of claim 30, further comprising:

2 means for receiving commands from the external application over the Internet.

1 33. A computer readable medium comprising instructions being executed by a computer, the  
2 instructions including a computer-implemented software application for at least one  
3 semiconductor fabrication tool, the instructions for implementing the steps of:

4 (1) receiving data from a semiconductor fabrication tool, wherein the data is directed  
5 to the implementation of at least one process occurring within the semiconductor fabrication  
6 tool; and

7 (2) determining, from the data of said step (1), first specified qualities of a first  
8 chamber of the semiconductor fabrication tool in performing the at least one process, wherein the  
9 first specified qualities are directed to at least one of: a processing time required to perform the at  
10 least one process, a rate of producing defective output products of the at least one process, a  
11 uniformity of output products of the at least one process, and a capability index of the at least  
12 one process of the first chamber.

1 34. The medium of claim 33, further comprising the instructions for:

2 (a) receiving, over the Internet, a request from an external application to access  
3 information relating to the first specified qualities of said step (2); and

4 (b) making available only a pre-defined portion of the information to be accessed by  
5 the external application using an encryption application.

1       35.     The medium of claim 34, wherein the encryption application is based on Virtual Private  
2     Network (VPN) technology.

1       36.     The medium of claim 33, wherein said step (1) comprises the step of receiving data from  
2     the semiconductor fabrication tool performing at least one of a deposition process, an etching  
3     process, and a metrology process as one of the at least one process of the first chamber.

1       37.     The medium of claim 33, wherein the capability index is a Cpk value.

1       38.     The medium of claim 33, further comprising the steps of:

2                 generating detailed status information that includes information relating to the first  
3     specified qualities of the first chamber, of said step (1) and relating to maintenance information  
4     of the first chamber.

1       39.     The medium of claim 38, further comprising the steps of:

2                 (a)     receiving a request from an external application to access the detailed status

3     information; and

4                 (b)     making available only a pre-defined portion of the detailed status information to  
5     be accessed by the external application.

1       40.     The medium of claim 33, further comprising the step of:

2                 determining second specified qualities of a second chamber of the semiconductor

3     fabrication tool in performing the at least one process of said step (1), wherein the second  
4     specified qualities are directed to at least one of: a processing time required to perform the at  
5     least one process, a rate of producing defective output products of the at least one process, a

6 uniformity of output products of the at least one process, and a capability index of the at least  
7 one process of the second chamber.

1 41. The medium of claim 40, wherein said step (1) comprises the step of receiving data from  
2 the semiconductor fabrication tool performing at least one of a deposition process, an etching  
3 process, and a metrology process as one of the at least one process of the second chamber.

1 42. The medium of claim 40, further comprising the steps of:

2 (a) receiving a request from an external application to qualify the first and second  
3 chambers for a first requested process; and

4 (b) making accessible information relating to the first and second specified qualities  
5 of the first and second chambers.

1 43. The medium of claim 40, further comprising the step of:

2 receiving a request to perform a first requested process and selecting one or more of the  
3 first and second chambers to perform the first requested process based on specified preferences  
4 which form part of the request and on the information relating to the first and second specified  
5 qualities of the first and second chambers.

1 44. The medium of claim 42, further comprising the step of:

2 receiving commands from the external application of said step (a) over the Internet.

1 45. A semiconductor fabrication system, comprising:

2 a first semiconductor fabrication tool,

3                   wherein the first semiconductor fabrication tool includes a first chamber  
4                   configured to perform at least one process on a semiconductor wafer;

5                   a software application, in communication with the first semiconductor fabrication tool,  
6                   configured to determine first specified qualities of the first chamber in performing the at least  
7                   one process,

8                   wherein the first specified qualities are directed to at least one of: a processing  
9                   time required to perform the at least one process, a rate of producing defective output products of  
10                  the at least one process, a uniformity of output products of the at least one process, and a  
11                  capability index of the at least one process of the first chamber; and

12                  a second chamber configured to perform at least one process on a semiconductor wafer,

13                  wherein the software application is further configured to determine second specified  
14                  qualities of the second chamber in performing the at least one process,

15                  wherein the second specified qualities are directed to at least one of: a processing time  
16                  required to perform the at least one process of the second chamber, a rate of producing defective  
17                  output products of the at least one process of the second chamber, a uniformity of output  
18                  products of the at least one process of the second chamber, and a capability index of the at least  
19                  one process of the second chamber, and

20                  wherein the software application is further configured to receive a request from an  
21                  external application to qualify the first and second chambers for a first requested process and  
22                  make accessible information relating to the first and second specified qualities of the first and  
23                  second chambers.

1       46.     The system of claim 45, wherein the software application is further configured to receive  
2     a request to perform a first requested process and select one or more of the first and second  
3     chambers to perform the first requested process based on specified preferences which form part  
4     of the request and on the information relating to the first and second specified qualities of the  
5     first and second chambers.

1       47.     The system of claim 45, wherein the software application is further configured to  
2     generate detailed status information that includes information relating to the first specified  
3     qualities of the first chamber and relating to maintenance information of the first chamber.

1       48.     The system of claim 47, wherein the software application is further configured to receive  
2     a request from an external application to access the detailed status information and configured to  
3     make available only a pre-defined portion of the detailed status information to be accessed by the  
4     external application.

1       49.     A method of fabrication semiconductors, comprising the steps of :

2              (1)     receiving data from a semiconductor fabrication tool directed to qualities of at  
3     least one process occurring within the semiconductor fabrication tool; and

4              (2)     determining first specified qualities of a first chamber of the semiconductor  
5     fabrication tool in performing the at least one process, wherein the first specified qualities are  
6     directed to at least one of: a processing time required to perform the at least one process, a rate of  
7     producing defective output products of the at least one process, a uniformity of output products  
8     of the at least one process, and a capability index of the at least one process of the first chamber;

9              (3)     determining second specified qualities of a second chamber of the semiconductor

10 fabrication tool in performing the at least one process, wherein the second specified qualities are  
11 directed to at least one of: a processing time required to perform the at least one process, a rate of  
12 producing defective output products of the at least one process, a uniformity of output products  
13 of the at least one process, and a capability index of the at least one process of the second  
14 chamber; and

15 (4) receiving a request from an external application to qualify the first and second  
16 chambers for a first requested process and make accessible information relating to the first and  
17 second specified qualities of the first and second chambers.

1 50. The method of claim 49, further comprising the step of:

2 receiving a request to perform a first requested process and selecting one or more of the  
3 first and second chambers to perform the first requested process based on specified preferences  
4 which form part of the request and on the information relating to the first and second specified  
5 qualities of the first and second chambers.

1 51. The method of claim 49, further comprising the step of:

2 generating detailed status information that includes information relating to the first  
3 specified qualities of the first chamber and relating to maintenance information of the first  
4 chamber.

1 52. The method of claim 51, further comprising the step of:

2 receiving a request from an external application to access the detailed status information  
3 and making available only a pre-defined portion of the detailed status information to be accessed  
4 by the external application.

TOP SECRET - INVESTIGATIVE